PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2012 Fisheries Management Survey Report

Lake Timpson

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Timpson were surveyed in 2012 using electrofishing and trap netting and in 2013 using gill netting. Historical data are presented with the 2012-2013 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Lake Timpson is located in Shelby County. The Shelby County Freshwater Supply District is the controlling authority. Primary uses are water supply and recreation. This reservoir has a surface area of 223 acres, a shoreline length of 8 miles, and an average depth of 8 feet. Water level fluctuations average 1-3 feet annually. Boat and bank access is adequate, with one boat ramp present.

- **Management History:** Important sport fish included Largemouth Bass, crappie, and catfish. Prior to 1994, Largemouth Bass were managed under statewide regulations. In 1994, Largemouth Bass regulations were changed to a 14- to 21-inch slot length limit. This regulation has had the desired effect of producing increased numbers of Largemouth Bass that are within the protective slot length limit. In 2003, hydrilla was found in Lake Timpson, and coverage expanded to 40% of the reservoir surface area in 2004. Triploid Grass Carp were stocked in 2004 at a rate of 5 fish/vegetated acre (448 fish) to reduce hydrilla coverage. Since 2006, no hydrilla has been observed. In 2010, giant salvinia was discovered, and eradication was accomplished with numerous herbicide treatments; no plants were observed in 2011 or 2012.

- **Fish Community**
  - **Prey species:** Threadfin Shad were abundant in the reservoir. Electrofishing catch rates of Bluegill and Redear Sunfish declined since the previous survey in 2007. However, relative abundance of 6- to 8-inch Redear Sunfish was relatively high and stable. Other prey species included Yellow Bass, Redbreast Sunfish, and Longear Sunfish.

  - **Catfishes:** Blue Catfish and Channel Catfish were present in the reservoir. Blue Catfish were stocked in 1998, but only four large fish (> 36 inches) have been collected since 2008, indicating no natural recruitment. Channel Catfish catch was also low, indicating poor reproduction.

  - **Yellow Bass:** Gill net surveys reflected an abundant Yellow Bass population. Catch rates were 64.6 and 36.4/nn in 2008 and 2012, respectively.

  - **Largemouth Bass:** Largemouth Bass were relatively abundant. Population size structure from recent surveys indicate the protective slot length limit has had the desired effect, with an abundance of Largemouth Bass within the protective slot length limit available for angler catch. Largemouth Bass had fast growth rates and were in moderate condition.

  - **Crappies:** Both White and Black Crappie were present in the reservoir. Black Crappie was the only species sampled during the 2012 trap netting survey, and abundance had declined significantly since 2007.

- **Management Strategies:** Continue to manage Largemouth Bass with a 14- to 21-inch slot length limit. Continue to monitor trends of hydrilla and giant salvinia coverage through annual aquatic vegetation surveys. Conduct electrofishing (fall and spring), trap net, gill net, and access surveys in 2016 and 2017.

INTRODUCTION

This document is a summary of fisheries data collected from Timpson Reservoir in 2012-2013. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2012-2013 data for comparison.

Reservoir Description

Lake Timpson is a 223-acre impoundment constructed in 1956 (Table 1). It is located in Shelby County approximately 5 miles northeast of Garrison and is operated and controlled by the Shelby County Freshwater Supply District. Primary water uses include municipal water supply and recreation. Secchi disc readings are typically 2-4 feet. Habitat at time of sampling consisted of rocks, concrete, and limited aquatic vegetation. Hydrilla was first discovered in 2003 but no plants have been found since 2006. Giant salvinia was found in 2010. A rapid response that included numerous herbicide treatments appears to have resulted in eradication, as no plants were found in 2011 or 2012. The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development. Other descriptive characteristics for Lake Timpson are in Table 1.

Angler Access

Lake Timpson has one public boat ramp and a courtesy dock is present. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp area.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ashe and Driscoll 2008) included:

1. Continue to monitor aquatic vegetation annually (2008-2012).
   Action: Aquatic vegetation surveys have been conducted annually to monitor for presence of hydrilla and giant salvinia.
2. Continue to remain vigilant to identify the presence of giant salvinia with plans to initiate an eradication or control response if any plants are found. Maintain signs educating the public of giant salvinia identification and reminding boaters to do a boat trailer inspection to ensure giant salvinia is not introduced to the reservoir.
   Action: Giant salvinia was found in 2010 and plants were treated with herbicides numerous times. No giant salvinia was observed in 2011 or 2012. Public educational signs have been maintained.
3. Continue to monitor Largemouth Bass size structure and growth to assess the success of the implemented slot limit by fall and spring electrofishing.
   Action: Fall and spring electrofishing surveys were conducted and growth was examined in 2012-2013.

Harvest regulation history: Sport fishes in Lake Timpson are currently managed with statewide regulations, with the exception of Largemouth Bass (Table 3). Prior to 1994, Largemouth Bass were managed with statewide regulations. A 14- to 21-inch slot length limit was implemented in 1994 to improve Largemouth Bass population size structure, growth, and size of bass caught by anglers.

Stocking history: Blue and Channel Catfish have been stocked into the reservoir. Florida Largemouth Bass fingerlings were stocked in 1980 and again in 1996. Threadfin Shad were introduced in 1979. Triploid Grass Carp were stocked in 2004. The complete stocking history is in Table 4.

Vegetation/habitat management history: Lake Timpson aquatic vegetation coverage has declined significantly since 2004. In 2004, the reservoir had problematic hydrilla coverage (40% of reservoir surface area). A triploid grass carp stocking in 2004 (5 fish/vegetated acre) was successful, as no hydrilla has been documented since 2006. Giant salvinia was discovered in 2010 and a rapid eradication response was implemented using herbicides. Vegetation surveys conducted in 2011 and 2012 indicated no giant salvinia presence (Table 6). Since 2011, native aquatic vegetation coverage was limited to less than 2 acres (coontail, water primrose, and giant cutgrass).

Water transfer: Lake Timpson is primarily used for municipal water supply and recreation. Currently, there are no interbasin water transfers from the reservoir.

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations during fall and spring), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Standard error (SE) was calculated for structural indices. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics. Ages were determined for Largemouth Bass using otoliths (N=13).

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite DNA analysis was used to determine genetic composition of individual fish.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of rocky shoreline and emergent vegetation (Tables 5 and 6). Hydrilla has not been documented since 2006, although tubers are likely present in the substrate. The eradication of hydrilla can be attributed to the grass carp stocking in 2004 and low water levels in 2005, 2006, and 2011. Low water levels in 2011 also reduced coverage of coontail. Giant salvinia was discovered in 2010. Rapid treatment with herbicides likely eradicated giant salvinia, as no plants were observed in 2011 or 2012.

Prey species: Relative abundance of Threadfin Shad was high in 2012 (9,600.0/h) (Appendix A). Bluegill and Redear Sunfish catch rates (301.0 and 139.0/h, respectively) were lower than was sampled in 2007 (892.0 and 448.0/h, respectively) (Figures 1 and 2). However, larger Redear Sunfish (6 – 8 inches) were relatively abundant during both years. Other prey species included Yellow Bass, Redbreast Sunfish, and Longear Sunfish.

Catfishes: Blue Catfish were stocked in 1998 but no natural recruitment has occurred. Only four large Blue Catfish (> 36 inches) have been sampled with gill nets since 2008 (Figure 3). Channel Catfish abundance was relatively low and stable, as gill net catch rates were 1.2/nn in 2008 and 1.4/nn in 2013 (Figure 4).

Yellow Bass: Gill net surveys reflect an abundant Yellow Bass population. Catch rates were 64.6 and 36.4/nn in 2008 and 2012, respectively.

Largemouth Bass: Fall electrofishing catch rates were 184.0/h and 148.0/h in 2007 and 2012, respectively, and catch was dominated by fish ≤ 10 inches, indicating successful and stable recruitment (Figure 5). The spring electrofishing catch rate in 2013 (136.0/h) was lower than catch rates observed in 2008 (221.0/h), but size structure was desirable during both years (PSD–14 = 53 for 2008 and 73 for 2013) (Figure 6). Growth of Largemouth Bass was fast; average age at 14 inches (13.5 to 14.5 inches) was 2.3 years (N = 13; range = 1 to 3 years). Florida Largemouth Bass were last stocked in 1996 (Table 4). In 2012, Florida Largemouth Bass allele frequency was 40.0% and one pure fish was collected (Table 7).

Crappies: Although both White and Black Crappie were present in the reservoir, only Black Crappie were collected with trap nets. Catch rates in 2012 (2.4/nn) were considerably lower than in 2007 (44.8/nn) (Figure 7).

Fisheries management plan for Lake Timpson, Texas

Prepared – July 2013.

ISSUE 1: Hydrilla in Lake Timpson was first documented by TPWD in 2003. Since then, hydrilla has proven to be problematic as coverage reached 40% of the reservoir surface area in 2004. Triploid grass carp were stocked at a rate of 5 fish/vegetated acre in 2004. No hydrilla has been observed since 2006. However, tubers are likely present in the substrate and recolonization is possible.

MANAGEMENT STRATEGY

1. Continue to monitor aquatic vegetation annually (2013-2017). If hydrilla coverage reappears within the next 4 years, meet with county officials and angling public to develop an integrated aquatic vegetation management plan.

ISSUE 2: In 2010, giant salvinia was introduced in Lake Timpson. A rapid eradication response was undertaken and no giant salvinia has been found since then.

MANAGEMENT STRATEGY

1. During aquatic vegetation surveys continue to remain vigilant to identify any presence of giant salvinia. Maintain educational signs regarding giant salvinia identification and boat trailer inspections before launching.

ISSUE 3: The 14- to 21-inch slot length limit implemented in 1994 has been successful. Recruitment of Largemouth Bass into the slot limit has been relatively high. Growth rates of fish below the slot were rapid.

MANAGEMENT STRATEGY

1. Continue to monitor Largemouth Bass size structure and growth to assess the success of the implemented slot limit by fall electrofishing (2016) and spring electrofishing (2017).

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc… so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes an angler access survey (2016), additional aquatic vegetation surveys (2013-2016), additional spring electrofishing (2017), and standard monitoring with fall electrofishing, gill nets and trap nets (2016/2017) (Table 6). Additional aquatic vegetation surveys are required to monitor for presence of hydrilla and giant salvinia.

LITERATURE CITED

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Ashe, D., and T. Driscoll. 2008. Statewide freshwater fisheries monitoring and management program survey report for Timpson Reservoir, 2007. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Guy, C. S., R. M. Neuman, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

Table 1. Characteristics of Lake Timpson, Texas.

Characteristic	Description
Year constructed	1956
Controlling authority	Shelby County Freshwater Supply District
County	Shelby
Reservoir type	Mainstream
Shoreline Development Index (SDI)	3.8
Mean depth	8 feet
Size	223 acres
Secchi disc	2-4 feet
Conductivity	120 uS/cm

Table 2. Boat ramp characteristics for Lake Timpson, Texas, August, 2012. Reservoir elevation at time of survey was 317 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Condition
Public Boat Ramp	31.84521 -94.42646	Y	15	Excellent. Recent resurfacing of parking area.

Table 3. Harvest regulations for Lake Timpson, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, Largemouth	5 (only 1 > 24 inches)	14- to 21-inch slot
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Lake Timpson, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults; UNK = unknown.

Species	Year	Number	Life Stage	Mean TL (in)
Blue Catfish	1998	3,027	AFGL	7.2
	Total	3,027		
Channel Catfish	1966	12,000	AFGL	7.9
	1992	2,000	AFGL	5.5
	1995	5,934	AFGL	7.2
	Total	19,934		
Flathead Catfish	1992	16	ADL	22.0
	Total	16		
Florida Largemouth Bass	1980	10,000	FGL	2.0
	1996	5,981	FGL	1.3
	Total	15,981		
Triploid Grass Carp	2004	448	AFGL	UKN
	Total	448		
Threadfin Shad	1979	1,200	AFGL	2.9
	Total	1,200		

Table 5. Survey of structural habitat types, Lake Timpson, Texas, 2007. Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Natural shoreline	3.6 miles	57.5
Rocky shoreline	2.4 miles	30.0
Concrete	1.0 miles	12.5

Table 6. Survey of aquatic vegetation, Lake Timpson, Texas, 2009 – 2012. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2009	2010	2011	2012
Coontail	95 (42.6)	26 (11.7)		trace
Water primrose	1 (0.5)	1 (0.5)	1 (0.5)	1 (0.5)
Giant cutgrass	2 (0.9)	4 (1.8)	trace	trace
Giant salvinia		trace		

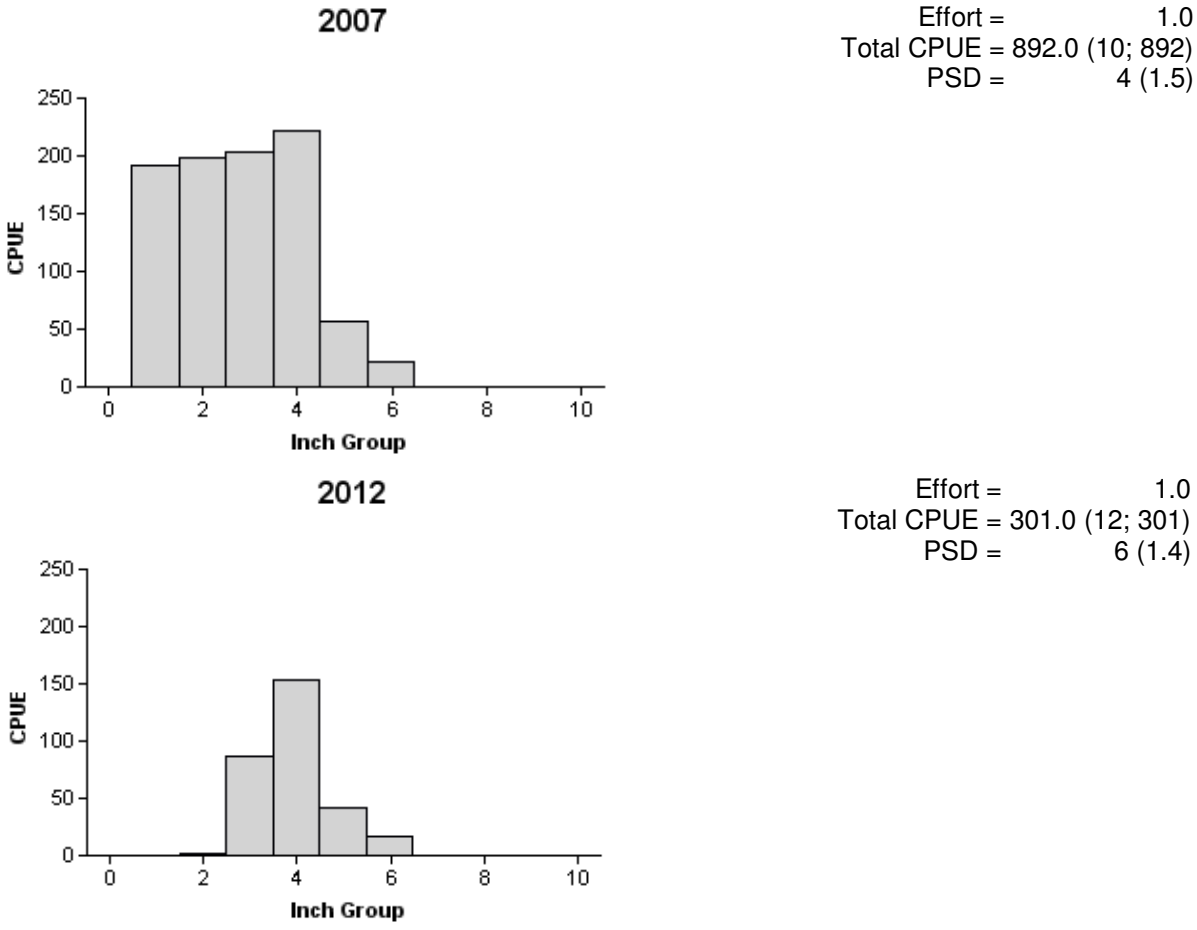


Figure 1. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2007 and 2012.

Redear Sunfish

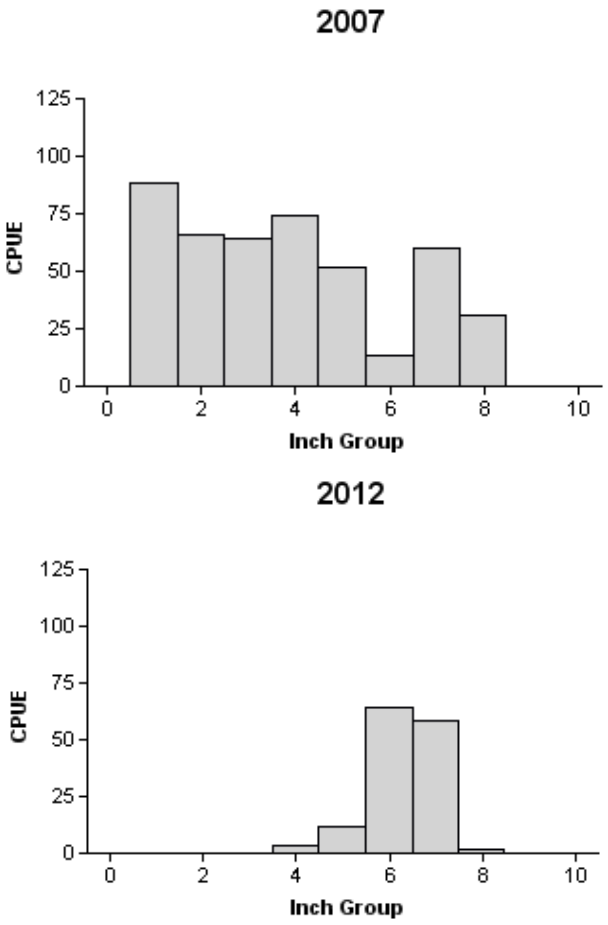
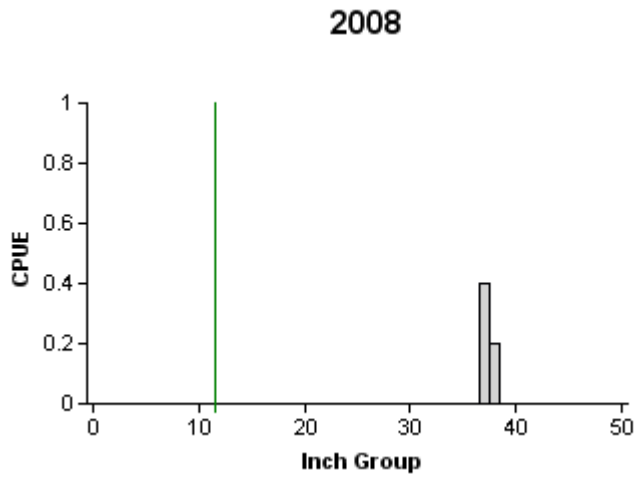
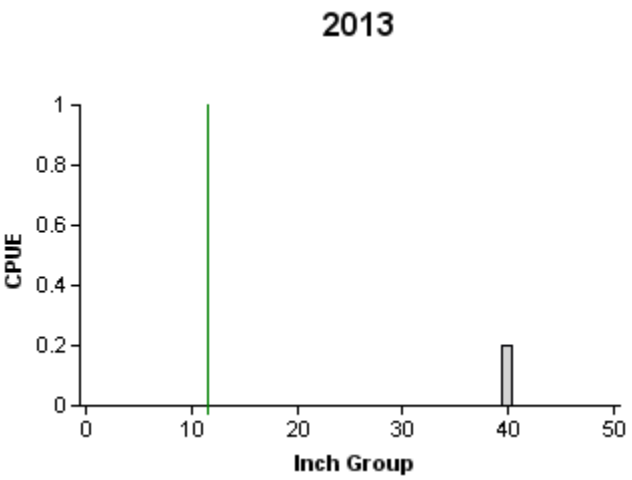


Figure 2. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2007 and 2012.

Blue Catfish



Effort = 5.0
Total CPUE = 0.6 (67; 3)
PSD = 100 (0)



Effort = 5.0
Total CPUE = 0.2 (100; 1)
PSD = 100 (0)

Figure 3. Number of Blue Catfish caught per net night (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Timpson, Texas, 2008 and 2013. Vertical line represents the minimum length limit.

Channel Catfish

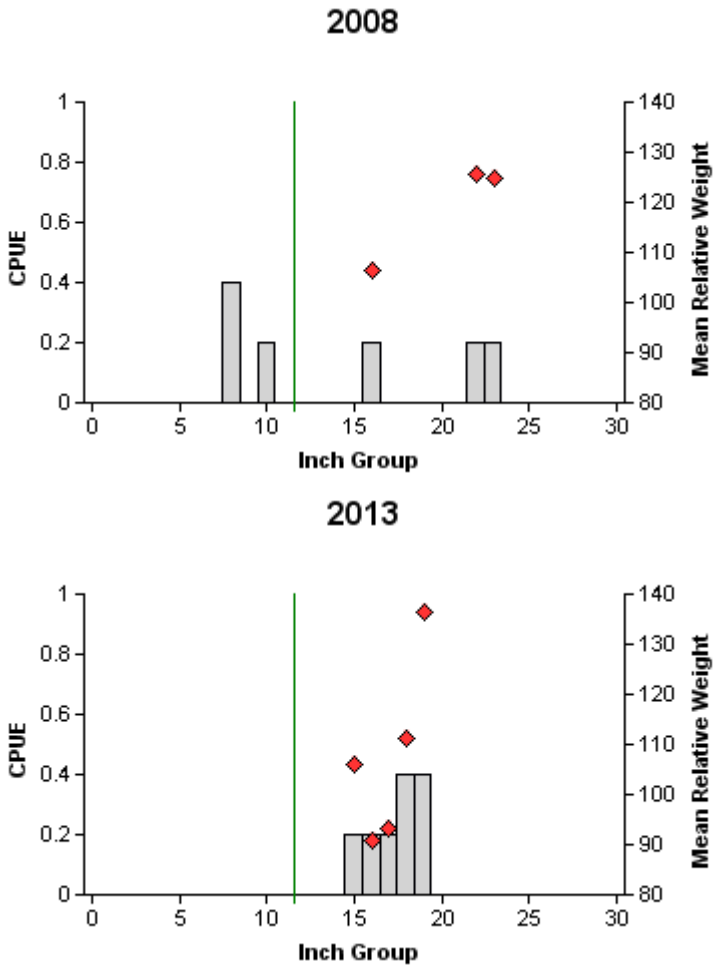
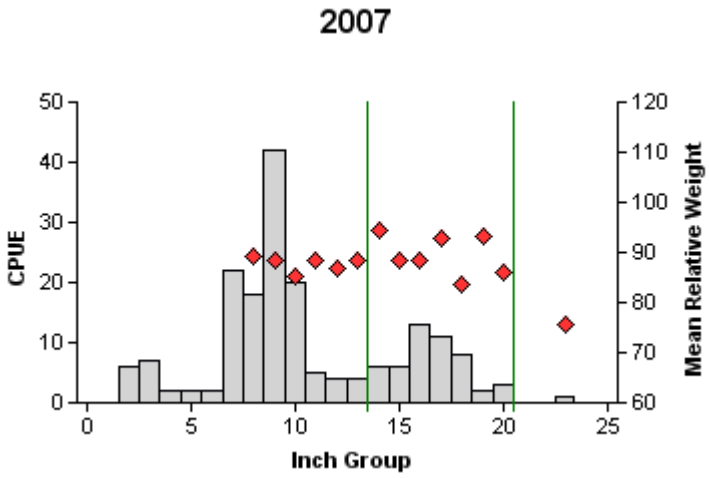
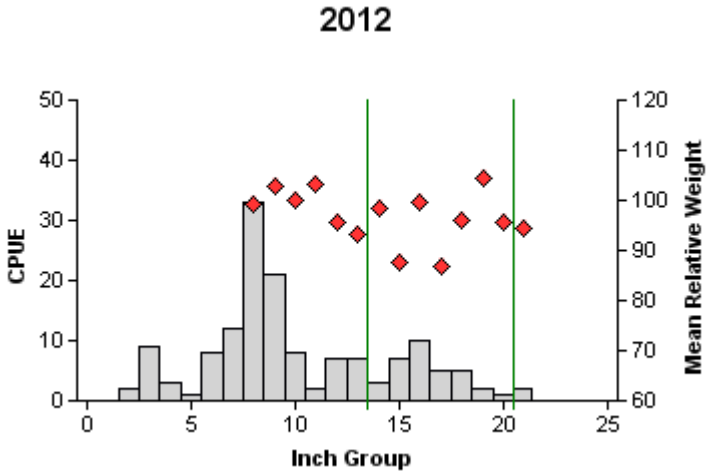


Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Timpson, Texas, 2008 and 2013. Vertical line represents the minimum length limit.

Largemouth Bass



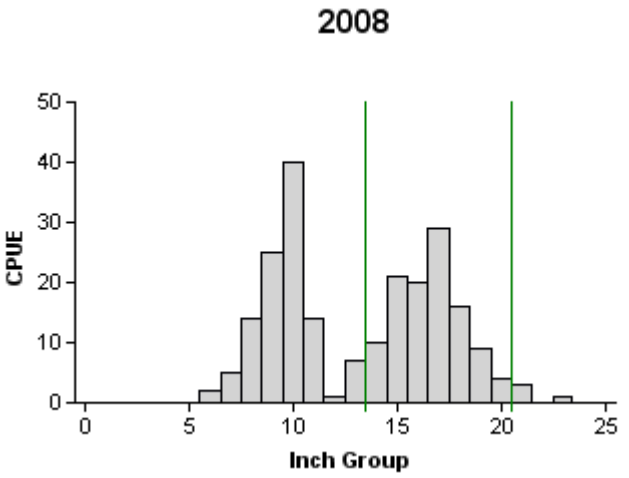
Effort =	1.0
Total CPUE =	184.0 (12; 184)
PSD =	41 (4.9)
PSD-14 =	35 (5)
PSD-21 =	1 (0.7)



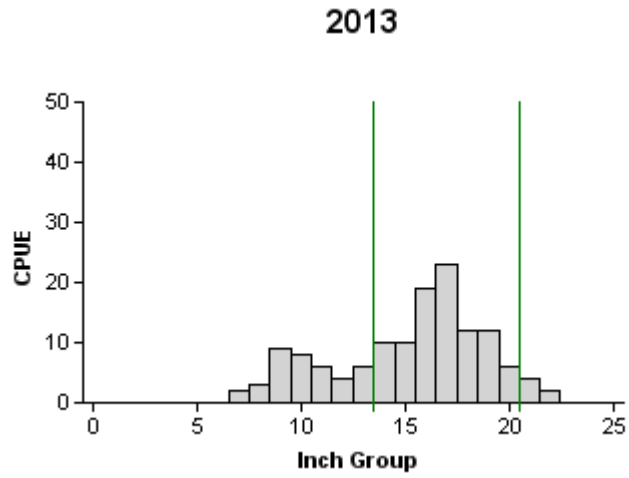
Effort =	1.0
Total CPUE =	148.0 (11; 148)
PSD =	43 (5.5)
PSD-14 =	31 (5)
PSD-21 =	2 (1.2)

Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2007 and 2012. Vertical lines represent the slot length limit.

Largemouth Bass



Effort =	1.0
Total CPUE =	221.0 (14; 221)
PSD =	57 (4.3)
PSD-14 =	53 (4.6)
PSD-21 =	2 (1.1)



Effort =	1.0
Total CPUE =	136.0 (8; 136)
PSD =	81 (3.5)
PSD-14 =	73 (4.7)
PSD-21 =	4 (1.7)

Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Lake Timpson, Texas, 2008 and 2013. Vertical lines represent the slot length limit.

Table 7. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Timpson, Texas, 2012. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

		Number of fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB
2012	30	1	27	2	40.0	3.3

Black Crappie

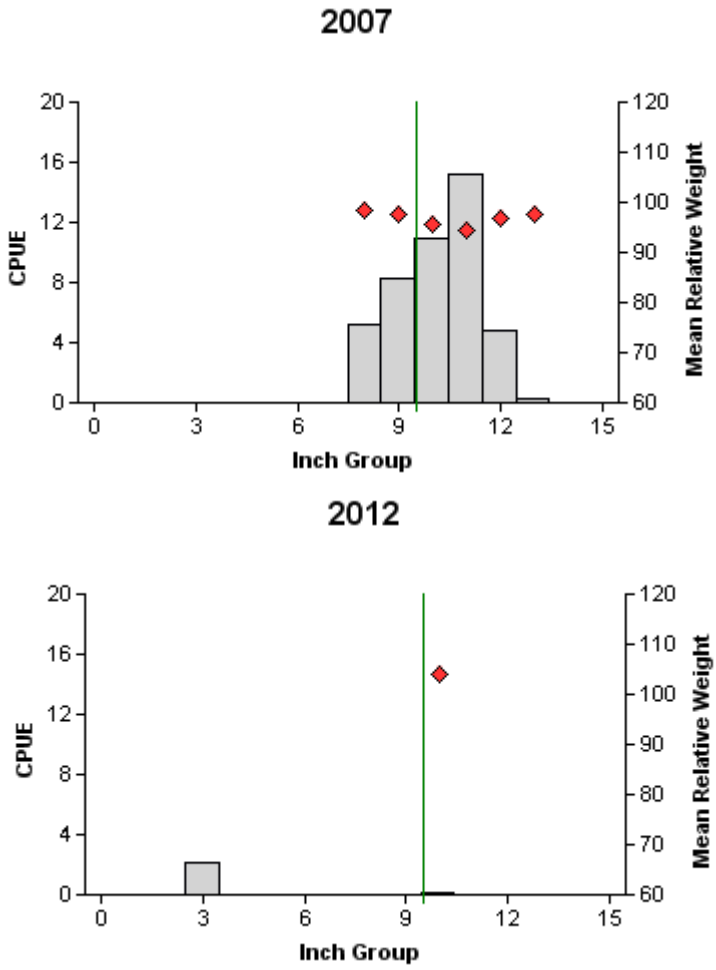


Figure 7. Number of Black Crappie caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Timpson, Texas, 2007 and 2012. Vertical line represents the minimum length limit.

Table 8. Proposed sampling schedule for Lake Timpson, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while standard electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

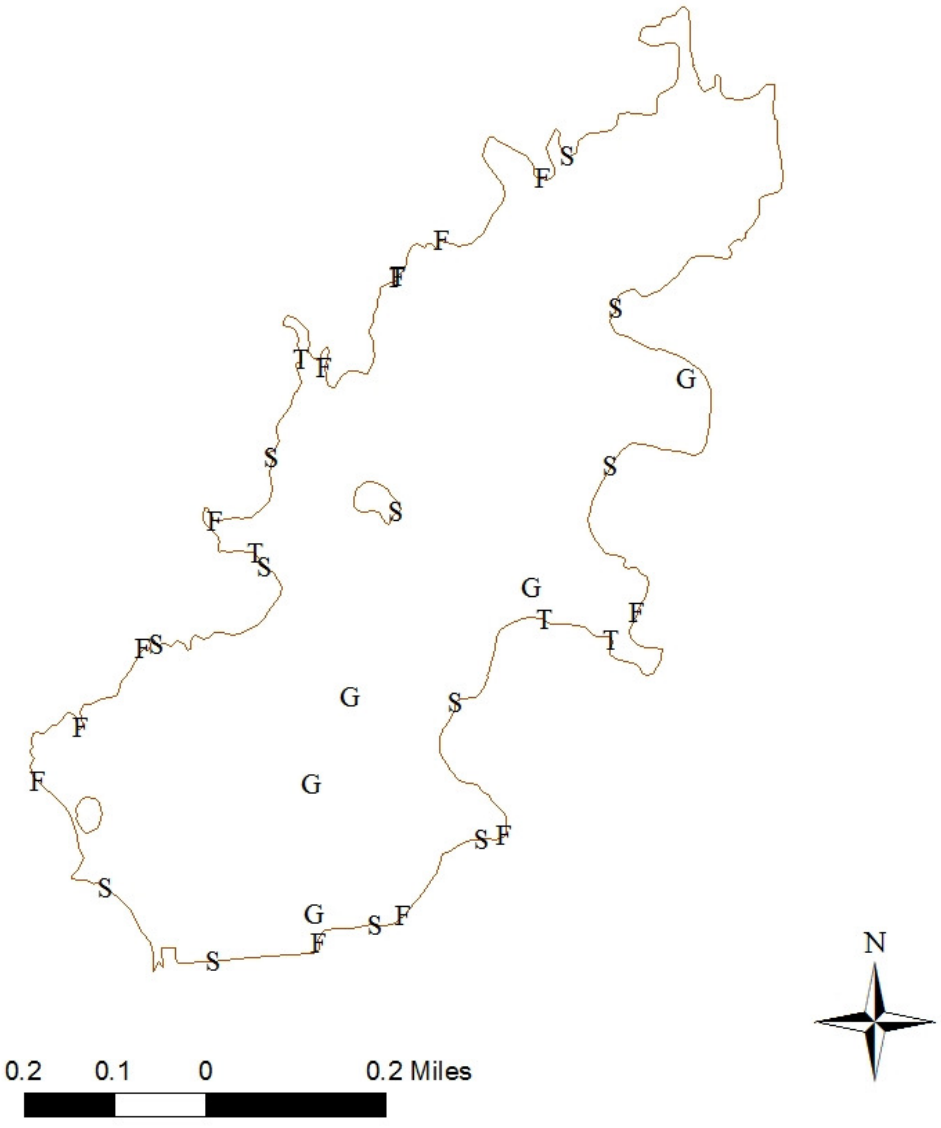
Survey year	Electrofish Fall(Spring)	Gill net	Trap net	Habitat		Access	Report
				Structural	Vegetation		
2013-2014					A		
2014-2015					A		
2015-2016					A		
2016-2017	S (A)	S	A		S	S	S

Appendix A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Timpson, Texas, 2012-2013. Sampling effort was 5 net nights for gill netting and trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Threadfin Shad					9,600	9,600.0
Blue Catfish	1	0.2				
Channel Catfish	7	1.4				
Yellow Bass	182	36.4				
Redbreast Sunfish					43	43.0
Bluegill				`	301	301.0
Longear Sunfish					1	1.0
Redear Sunfish	3	0.6			139	139.0
Largemouth Bass	15	3.0			148	148.0
White Crappie	8	1.6				
Black Crappie	21	4.2	12	2.4		

Appendix B



Location of sampling sites, Lake Timpson, Texas, 2012-2013. Trap net, gill net and fall/spring electrofishing stations are indicated by T, G, F, and S, respectively.